

WHAT IS CLAIMED IS:

1. A network, comprising:

a primary network controller; and

a plurality of network devices, wherein each network device is connected to the primary network controller by a respective primary network path; and

at least one predetermined primary backup network path connecting each network device with the primary network controller, wherein each predetermined primary backup network path is blocked by the network controller when a corresponding primary network path is active;

wherein, when a primary network path between a network device and the primary network controller fails, the primary network controller blocks the failed primary network path and switches to one of the predetermined primary backup network paths.

2. The network of claim 1, wherein the primary network controller periodically tests a condition of the predetermined backup network paths.

3. The network of claim 1, further comprising:

a secondary network controller that takes over control of the network if the primary network controller fails, wherein each network device is connected to the secondary network controller by a respective secondary network path;

at least one predetermined secondary backup network path connecting each network device with the secondary network controller, wherein each predetermined secondary backup network path is blocked by the network controller when a corresponding secondary network path is active;

wherein, when a secondary network path between a network device and the secondary network controller fails, the secondary network controller blocks the inoperable secondary network path and switches to one of the predetermined secondary backup network paths.

4. The network of claim 3, wherein the secondary network controller periodically tests a condition of the predetermined secondary backup network paths.

5. The network of claim 1, wherein at least a portion of the respective primary network paths and at least a portion of the predetermined primary backup network paths each comprise a 10 megabit per second connection.

6. The network of claim 5, wherein the 10 megabit per second connection comprises an Ethernet 10Base-T connection.

7. The network of claim 5, wherein the 10 megabit per second connection comprises twisted-pair cable, fiber optic cable and/or coaxial cable.

8. The network of claim 5, wherein the 10 megabit per second connection comprises a wireless connection.

9. The network of claim 1, wherein at least a portion of the respective primary network paths and at least a portion of the predetermined primary backup network paths each comprise a 100 megabit per second connection.

10. The network of claim 9, wherein the 100 megabit per second connection comprises an Ethernet 100Base-T connection.

11. The network of claim 9, wherein the 100 megabit per second connection comprises twisted-pair cable, fiber optic cable and/or coaxial cable.

12. The network of claim 9, wherein the 100 megabit per second connection comprises a wireless connection.

13. The network of claim 1, wherein the primary network controller comprises a computer.

14. The network of claim 1, wherein the respective primary network paths and the predetermined primary backup network paths each comprise a plurality of network bridges.

15. The network of claim 14, wherein the plurality of network bridges comprise a plurality of Ethernet switches.

16. The network of claim 1, wherein at least some of the network devices comprise universal relays.

17. The network of claim 1, wherein at least some of the network devices comprise process controllers.

18. A control and data acquisition system comprising the network of claim 1.

19. The control and data acquisition system of claim 18, wherein the primary network controller monitors a status of an electrical power grid through the network.

20. A control and data acquisition system, comprising:  
at least one network controller;  
a plurality of universal relays;  
a plurality of process controllers, wherein each universal relay and each process controller is connected with the at least one network controller by a respective primary network path; and

predetermined backup network paths connecting each universal relay and each process controller with the at least one network controller, wherein each predetermined backup network path is blocked by the at least one network controller when a corresponding primary network path is active;

wherein , when a primary network path fails, the at least one network controller blocks the failed primary network path and switches to one of the predetermined backup network paths.

21. The system of claim 20, wherein the at least one network controller periodically tests a condition of the predetermined backup network paths.

22. The system of claim 20, wherein at least a portion of the respective primary network paths and at least a portion of the predetermined backup network paths each comprise a 10 megabit per second connection..

23. The system of claim 22, wherein the 10 megabit per second connection comprises an Ethernet 10Base-T connection.

24. The system of claim 22, wherein the 10 megabit per second connection comprises twisted-pair cable, fiber optic cable and/or coaxial cable.

25. The system of claim 22, wherein the 10 megabit per second connection comprises a wireless connection.

26. The system of claim 20, wherein at least a portion of the respective primary network paths and at least a portion of the predetermined backup network paths each comprise a 100 megabit per second connection.

27. The system of claim 26, wherein the 100 megabit per second connection comprises an Ethernet 100Base-T connection.

28. The system of claim 26, wherein the 100 megabit per second connection comprises twisted-pair cable, fiber optic cable and/or coaxial cable.

29. The system of claim 26, wherein the 100 megabit per second connection comprises a wireless connection.

30. The system of claim 20, wherein the at least one network controller comprises at least one computer.

31. The system of claim 20, wherein the respective primary network paths and the predetermined backup network paths each comprise a plurality of network bridges.

32. The system of claim 31, wherein the plurality of network bridges comprise a plurality of Ethernet switches.

33. A method of implementing a network, comprising the steps of:

- determining a primary network path between a network controller and a network device, wherein the network controller and the network device exchange data over the primary network path;
- determining, prior to a failure of the primary network path, a backup network path between the network controller and the network device;
- monitoring a status of the primary network path;
- blocking the backup network path while the primary network path is active; and
- blocking the primary network path and making the backup network path active when the primary network path fails.

34. The method of claim 33, further comprising the step of periodically monitoring a condition of the backup network path.

35. The method of claim 33, wherein the network device comprises a universal relay.

36. The method of claim 33, wherein the network device comprises a process controller.

37. The method of claim 33, wherein the primary network path and the backup network path comprise network bridges.

38. A computer programmed with a network monitoring program, wherein the network monitoring program, when executed by the computer, performs the steps of:

determining a primary network path between a network controller and a network device, wherein the network controller and the network device exchange data over the primary network path;

determining, prior to a failure of the primary network path, a backup network path between the network controller and the network device;

monitoring a status of the primary network path;

blocking the backup network path while the primary network path is active; and

blocking the primary network path and making the backup network path active when the primary network path fails.

39. The computer of claim 38, wherein the network monitoring program performs the further step of periodically monitoring a condition of the backup network path.

40. The computer of claim 38, wherein the network device comprises a universal relay.



41. The computer of claim 38, wherein the network device comprises a process controller.

42. The computer of claim 38, wherein the primary network path and the backup network path comprise network bridges.

43. The computer of claim 42, wherein the network bridges comprise Ethernet switches.